

SEQUENCE LISTING <110> SCARPACE ADDAILIP J. LI, GANG <120> RAAV VECTOR-BASED PRO-OPIOMELANOCORTIN COMPOSITIONS AND METHODS <130> 4300.015400 <150> 60/462,496 <151> 2003-04-11 <160> 54 <170> PatentIn version 3.2 <210> 1 <211> 804 <212> DNA <213> Homo sapiens <400> 1 atgccgagat cgtgctgcag ccgctcgggg gccctgttgc tggccttgct gcttcaggcc 60 tccatggaag tgcgtggctg gtgcctggag agcagccagt gtcaggacct caccacggaa 120 agcaacctgc tggagtgcat ccgggcctgc aagcccgacc tctcggccga gactcccatg 180 ttcccgggaa atggcgacga gcagcctctg accgagaacc cccggaagta cgtcatgggc 240 cactteeget gggacegatt eggeegeege aacageagea geageggeag cageggegea 300 gggcagaagc gcgaggacgt ctcagcgggc gaagactgcg gcccgctgcc tgagggcggc 360 cccgagcccc gcagcgatgg tgccaagccg ggcccgcgcg agggcaagcg ctcctactcc 420 atggagcact tccgctgggg caagccggtg ggcaagaagc ggcgcccagt gaaggtgtac 480 cctaacggcg ccgaggacga gtcggccgag gccttccccc tggagttcaa gagggagctg 540 actggccagc gactccggga gggagatggc cccgacggcc ctgccgatga cggcgcaggg 600 gcccaggccg acctggagca cagcctgctg gtggcggccg agaagaagga cgagggcccc 660 tacaggatgg agcacttccg ctggggcagc ccgcccaagg acaagcgcta cggcggtttc 720 atgacetecg agaagageea gacgeeeetg gtgacgetgt teaaaaaege cateateaag 780 804

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<212> PRT

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<400> 2

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Ala Ile Ile Lys Asn Ala Tyr Lys Lys Gly Glu 260 265

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Phe	Gly	Arg 35	Arg	Asn	Ser	Ser	Ser 40	Ser	Ser	Gly	Ser	Gly 45	Ala	Gly	Gln
Lys	Arg 50	Glu	Asp	Val	Ser	Ala 55	Gly	Glu	Asp	Arg	Gly 60	Pro	Leu	Pro	Glu
Gly 65	Gly	Pro	Glu	Pro	Arg 70	Ser	Asp	Gly	Ala	Lys 75	Pro	Gly	Pro	Arg	Glu 80
Gly	Lys	Arg	Ser	Tyr 85	Ser	Met	Glu	His	Phe 90	Arg	Trp	Gly	Lys	Pro 95	Val

Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp 100 105 110

Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr Gly
115 120 125

Gln Arg Pro Arg Glu Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp Gly
130 135 140

Ala Gly Ala Gln Ala Asp Leu Glu His Ser Leu Leu Val Ala Ala Glu 145 150 155 160

Lys Lys Asp Glu Gly Pro Tyr Gly Met Glu His Phe Arg Trp Gly Ser 165 170 175

Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe 180 185

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Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Glu Cys Ile Arg 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Ser Ser Ser Gly Ser 85 90 95

Ala His Gln Lys Arg Glu Asp Val Ala Ala Gly Glu Asp Arg Gly Leu 100 105 110

Leu Pro Glu Gly Gly Pro Glu Pro Arg Gly Asp Gly Ala Gly Pro Gly
115 120 125

Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly 130 135 140

Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly 145 150 155 160

Ala Glu Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu 165 170 175

Leu Thr Gly Gln Arg Pro Arg Ala Gly Asp Gly Pro Asp Gly Pro Ala 180 185 190

Asp Asp Gly Ala Gly Pro Arg Ala Asp Leu Glu His Ser Leu Leu Val 195 200 205

Ala Ala Glu Lys Lys Asp Glu Gly Pro Tyr Arg Met Glu His Phe Arg 210 215 220 Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser 225 230 235 240

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Lys Asn Ala Tyr Lys Lys Gly Gln 260

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Ala Ala Gly Glu Asp Arg Gly Pro Leu Pro Glu Gly Gly Pro Glu Pro
35 40 45

Arg Ser Asp Gly Ala Glu Pro Gly Pro Arg Glu Gly Lys Arg Ser Tyr 50 60

Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg 65 70 75 80

Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu Ser Ala Glu Ala 85 90 95

Phe Pro Leu Glu Phe Lys Arg Glu Pro Thr Gly Gln Arg Leu Arg Glu 100 105 110

Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp Gly Ala Gly Ala Arg Ala 115 120 125

Asp Leu Glu His Asn Leu Leu Val Ala Ala Glu Lys Lys Asp Glu Gly 130 135 140

Pro Tyr Arg Met Glu His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys 145 150 155 160

Arg Tyr Gly Gly Phe 165

<210> 9

<211> 804

<212> DNA

<213> Sus scroffa

<400> 9

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Gln Cys Gln Asp Leu Ser Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn 50 55 60

Gly Asp Ala Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Gly 85 90 95

Gly Gly Gly Gly Gly Gly Ala Gly Gln Lys Arg Glu Glu Glu Glu 100 105 110

Val Ala Ala Gly Glu Gly Pro Gly Pro Arg Gly Asp Gly Val Ala Pro 115 120 125

Gly Pro Arg Gln Asp Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp 130 135 140

Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn 145 150 155 160

Gly Ala Glu Asp Glu Leu Ala Glu Ala Phe Pro Leu Glu Phe Arg Arg 165 170 175

Glu Leu Ala Gly Ala Pro Pro Glu Pro Ala Arg Asp Pro Glu Ala Pro 180 185 190

Ala Glu Gly Ala Ala Ala Arg Ala Glu Leu Glu Tyr Gly Leu Val Ala 195 200 205 Glu Ala Glu Ala Glu Lys Lys Asp Glu Gly Pro Tyr Lys Met Glu 210 215 220

His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe 225 230 235 240

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Ala Ile Val Lys Asn Ala His Lys Lys Gly Gln 260 265

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<400> 11

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<212> PRT

<213> Bos taurus

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aagt	acg	tca	tgggd	ccact	t c	cgct	gggad	c cg	gttt	ggcc	gcc	gcaa	tgg	cagc	gcgggc
caga	agc	gcg	aggaa	agaag	ga g	gtgg	egge	g g g(cgga	ggcc	gcg	cccc	gct	gccc	gcgggc
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Gln	Pro	Leu 35	Ala	Glu	Asn	Pro	Arg 40	Lys	Tyr	Val	Met	Gly 45	His	Phe	Arg
Trp	Asp 50	Arg	Phe	Gly	Arg	Arg 55	Asn	Gly	Ser	Ala	Gly 60	Gln	Lys	Arg	Glu
Glu	Glu	Glu	Val	Ala	Ala	Gly	Gly	Gly	Arg	Ala	Pro	Leu	Pro	Ala	Gly

Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly 100 105 Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu 115 120 Ser Ala Glu Ala Phe Pro Val Glu Phe Lys Arg Glu Leu Ala Gly Gln 130 135 140 Arg Leu Glu Pro Ala Leu Gly Pro Glu Gly Pro Ala Ala Gly Val Ala 145 150 160 Ala Leu Ala Asp Leu Glu Tyr Gly Leu Val Ala Glu Ala Gly Ala Ala 165 170 175 Glu Lys Lys Asp Asp Gly Pro Tyr Lys Met Glu His Phe Arg Trp Gly 180 185 190 Ser Pro Pro Lys Asp Lys Arg Tyr Val Gly Phe Met Ser Ser Glu Arg 195 200 205 Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile 210 215 220 <210> 15 <211> 771 <212> DNA Cavia porcellus <213> <400> 15 atgeegagat egtgetacag eegetegggg accetgetge tggeettget getteagate 60 tecatggaag tgeggggetg gtgeetggag ageageeagt gteaggaeet caccacggag 120 agacacctgc tggagtgcct ccqqqcctqc aaaccqqacc tctcqqccqa qacqccaqtq 180 tttccggggg gcgccgacga gcagacgccg accgagagcc cccggaagta cgtcacgggc 240 caetteeget ggggeegett eggeegeggt aacageageg gegegageea gaagegtgag 300 gaggaggegg eggeggeega ecceggette caeggegatg gegtegagee gggeetgege 360 gaggacaagc gctcctactc catggagcac ttccgctggg gcaagccggt gggcaagaag 420 cggcgcccgg tgaaggtgta cgcgaacggc gcggaggagg agtcggccga ggcctttccg 480 cttgagttca agegggaget gaeeggggag eggeeeggg eggegeeegg eeeegaegge 540

Gly Pro Gly Pro Arg Gly Asp Gly Glu Leu Gly Leu Gln Glu Gly

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600

660

720

771

170

Gly Pro Asp Gly Leu Gly Phe Gly Leu Val Ala Glu Ala Glu Ala Glu 180 185 190

Ala Ala Ala Glu Lys Lys Asp Ala Ala Glu Lys Lys Asp Asp Gly
195 200 205

Ser Tyr Arg Met Glu His Phe Arg Trp Gly Thr Pro Arg Lys Gly Lys 210 215 220

Arg Tyr Gly Gly Phe Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val 225 230 235 240

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<213> Mus musculus

<400> 20

Met Pro Arg Phe Cys Tyr Ser Arg Ser Gly Ala Leu Leu Leu Ala Leu 1 5 10 15

Leu Leu Gln Thr Ser Ile Asp Val Trp Ser Trp Cys Leu Glu Ser Ser 20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg 35 40 45

Ala Cys Lys Leu Asp Leu Ser Leu Glu Thr Pro Val Phe Pro Gly Asn 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Pro Arg Asn Ser Ser Ala Gly 85 90 95

Ser Ala Ala Gln Arg Arg Ala Glu Glu Glu Ala Val Trp Gly Asp Gly
100 105 110

His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Val Ala Glu Asn Glu Ser Ala Glu Ala Phe Pro Leu 150 155 Glu Phe Lys Arg Glu Leu Glu Gly Glu Arg Pro Leu Gly Leu Glu Gln Val Leu Glu Ser Asp Ala Glu Lys Asp Asp Gly Pro Tyr Arg Val Glu 185 His Phe Arg Trp Ser Asn Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe 200 205 Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn 210 215 220 Ala Ile Ile Lys Asn Ala His Lys Lys Gly Gln 225 230 <210> 21 759 <211> DNA <212> <213> Gallus gallus <400> 21 atgeggggeg egetgtgeea eageetgeee gtggtgetgg ggetgetget gtgteaeeee 60 accaccgcca gcggcccatg ctgggagaac agcaagtgcc aggacctggc caccgaggct 120 ggtgttttgc aggcgtgtgc caaggcatgc cgtgctgagc tgtcggccga ggcacccgtg 180 taccegggca atgggcacct geagececte teggagagea teegeaagta egtgatgage 240 catttccgct ggaacaagtt cggccgtcgc aacagcagca gcggagggca caaaagggag 300 gaggtggccg gcctcgccct gcctgccgcg tcaccccacc accccqccqq qqaqqaqaa 360 gatggagaag ggttggaacg agaggaaggg aagcgctcct actccatgga gcatttccgc 420 tggggcaagc cggtggggcg gaagaggaga cccatcaagg tgtaccccaa cggggtggac 480 gaggagtcgg ctgagagtta ccccatggag ttccggaggg agatggcgcc cgatggggac 540 cccttcggcc tctccgagga ggaggaagaa gaggaggaag aggaaggcga ggaggaaaag 600 aaggatggag getegtaeeg catgeggeae tteegetgge aegegeeget gaaggaeaag 660

Ser Pro Glu Pro Ser Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu

<210> 22 <211> 251 <212> PRT <213> Gallus gallus															
<400> 22															
Met 1	Arg	Gly	Ala	Leu 5	Cys	His	Ser	Leu	Pro 10	Val	Val	Leu	Gly	Leu 15	Leu
Leu	Cys	His	Pro 20	Thr	Thr	Ala	Ser	Gly 25	Pro	Cys	Trp	Glu	Asn 30	Ser	Lys
Cys	Gln	Asp 35	Leu	Ala	Thr	Glu	Ala 40	Gly	Val	Leu	Ala	Cys 45	Ala	Lys	Ala
Cys	Arg 50	Ala	Glu	Leu	Ser	Ala 55	Glu	Ala	Pro	Val	Tyr 60	Pro	Gly	Asn	Gly
His 65	Leu	Gln	Pro	Leu	Ser 70	Glu	Ser	Ile	Arg	Lys 75	Tyr	Val	Met	Ser	His 80
Phe	Arg	Trp	Asn	Lys 85	Phe	Gly	Arg	Arg	Asn 90	Ser	Ser	Ser	Gly	Gly 95	His
Lys	Arg	Glu	Glu 100	Val	Ala	Gly	Leu	Ala 105	Leu	Pro	Ala	Ala	Ser 110	Pro	His
His	Pro	Ala 115	Gly	Glu	Glu	Glu	Asp 120	Gly	Glu	Gly	Leu	Glu 125	Arg	Glu	Glu
Gly	Lys 130	Arg	Ser	Tyr	Ser	Met 135	Glu	His	Phe	Arg	Trp 140	Gly	Lys	Pro	Val
Gly 145	Arg	Lys	Arg	Arg	Pro 150	Ile	Lys	Val	Tyr	Pro 155	Asn	Gly	Val	Asp	Glu 160
Glu	Ser	Ala	Glu	Ser 165	Tyr	Pro	Met	Glu	Phe 170	Arg	Arg	Glu	Met	Ala 175	Pro
Asp	Gly	Asp	Pro 180	Phe	Gly	Leu	Ser	Glu 185	Glu	Glu	Glu	Glu	Glu 190	Glu	Glu
Glu	Glu	Gly	Glu	Glu	Glu	Lys	Lys	Asp	Gly	Gly	Ser	Tyr	Arg	Met	Arg

cgctacggcg gcttcatgag cttggagcac agccagaccc cgctgatgac tctgttcaaa

aacgccatcg tcaaaagcgc ctacaagaag ggtcagtga

720

195 200 205

His Phe Arg Trp His Ala Pro Leu Lys Asp Lys Arg Tyr Gly Gly Phe 210 215 220

Met Ser Leu Glu His Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn 225 230 235 240

Ala Ile Val Lys Ser Ala Tyr Lys Lys Gly Gln 245 250

<210> 23

<211> 780

<212> DNA

<213> Bufo marinus

<400> 23

atgttgcagc cagggtggag atgtatcctg acaatactcg gggcgtttat atttcatgtc 60 ggtgaggtca agagtcagtg ctgggagagc ggtaaatgtg cagatctgac gagcgaggat 120 gggatactgg aatgtattaa agactgcaag atggtcctgt ctgcagagtc accagtgttt 180 cctgggaatg gacacatgca acccctctct gaaaacatca ggaagtatgt catgagccac 240 ttccgctgga ataagtttgg ccgaaggaat agcaccggtg gcgatagcaa caacgcaggt 300 tacaaacggg aagatatagc caactacccc atatttaacc tgttccccac taatgacaac 360 caaaacacac aagatggcaa catggaagaa gaactacgca ggcaagacaa caagaggtca 420 tattctatgg aacacttccg atggggtaaa ccagtcggga aaaaaaggag acctattaag 480 gttttcccaa qcqatqctqa aqaaqaatca tctqaaatct scccaacaqa qtacaqaaqa 540 gagttgtctg tagagtttga ctaccccgat accaactctg aagaagacat ggacgacagc 600 atgttgatgg aaagcccaaa tagaaaagat cggaagtata aaatgcatca ttttcgatgg 660 gaaggtccac ccaaagacaa aagatatgga ggattcatga cccctgagcg cagtcagact 720 ccactaatga ctcttttcaa aaatgccatt atcaaaaatg cccacaagaa gggtcaataa 780

<213> Bufo marinus

<210> 24

<211> 259

<212> PRT

<220>

<221> misc_feature

<222> (174)..(174)

<223> Xaa can be any naturally occurring amino acid

<400> 24

Met Leu Gln Pro Gly Trp Arg Cys Ile Leu Thr Ile Leu Gly Ala Phe Ile Phe His Val Gly Glu Val Lys Ser Gln Cys Trp Glu Ser Gly Lys Cys Ala Asp Leu Thr Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys Asp Cys Lys Met Val Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn Gly His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Gly Gly Asp Ser Asn Asn Ala Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr Pro Ile Phe Asn Leu Phe Pro Thr Asn Asp Asn Gln Asn Thr Gln Asp Gly Asn Met Glu Glu Glu Leu Arg Arg Gln Asp Asn Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Ile Lys Val Phe Pro Ser Asp Ala Glu Glu Ser Ser Glu Ile Xaa Pro Thr Glu Tyr Arg Arg Glu Leu Ser Val Glu Phe Asp Tyr Pro Asp Thr Asn Ser Glu Glu Asp Met Asp Asp Ser Met Leu Met Glu Ser Pro Asn Arq Lys Asp Arg Lys Tyr Lys Met His His Phe Arg Trp Glu Gly Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His Lys

245 250 255

Lys Gly Gln

<210> 25 <211> 669 <212> DNA <213> Cyprinus carpio <400> atggtgaggg gagagaggat gttgtgtcct gcttggctct tggctctggc tgttctgtgt 60 gcggctggat ctgaagtcag agctcagtgt atggaggacg cccgctgcag agacctcacc 120 actgatgaga acatcttgga ctgcatacag ctatgcaggt ctgatctgac agatgaaacc 180 cccgtctacc ctggagaaag ccatttgcag cctccctctg agctggagca aaccgaggtc 240 ctegtacece tgteeceage ggeecteget cetgetgage aaatggaeee egagteeage 300 cctcagcacg agcacaagcg ctcctactcc atggagcatt tccgctgggg aaagccagtg 360 ggtcgcaagc gcaggcctat caaggtgtac accaacggcg tggaggagga atccaccgag 420 actotoccag otgagatgag gogogagotg gotacaaacg agatogacta tootcaagag. 480 gagggcgctt taaaccagca ggataagaag gatggctcct acaaaatgag ccatttccgc 540 tggagcagcc cgcctgctag caagcgctat ggaggcttca tgaagtcctg ggacgagcgc 600 agtcagaaac cccttctcac gctcttcaaa aacgtcataa acaaagagca ccagaagaag 660 gaccagtga 669

<210> 26 <211> 222

<212> PRT

<213> Cyprinus carpio

<400> 26

Met Val Arg Gly Glu Arg Met Leu Cys Pro Ala Trp Leu Leu Ala Leu
1 10 15

Ala Val Leu Cys Ala Ala Gly Ser Glu Val Arg Ala Gln Cys Met Glu 20 25 30

Asp Ala Arg Cys Arg Asp Leu Thr Thr Asp Glu Asn Ile Leu Asp Cys 35 40 45

Ile Gln Leu Cys Arg Ser Asp Leu Thr Asp Glu Thr Pro Val Tyr Pro 50 55 60

Leu Val Pro Leu Ser Pro Ala Ala Leu Ala Pro Ala Glu Gln Met Asp Pro Glu Ser Ser Pro Gln His Glu His Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys Val Tyr Thr Asn Gly Val Glu Glu Glu Ser Thr Glu Thr Leu Pro Ala Glu Met Arg Arg Glu Leu Ala Thr Asn Glu Ile Asp Tyr Pro Gln Glu Glu Gly Ala Leu Asn Gln Gln Asp Lys Lys Asp Gly Ser Tyr Lys Met Ser His Phe Arg Trp Ser Ser Pro Pro Ala Ser Lys Arg Tyr Gly Gly Phe Met Lys Ser Trp Asp Glu Arg Ser Gln Lys Pro Leu Leu Thr Leu Phe Lys Asn Val Ile Asn Lys Glu His Gln Lys Lys Asp Gln <210> <211> <212> DNA <213> Danio rerio <400> atggtgaggg gagtgaggat gttgtgtcct gcttggctct tggctctggc tgttctctgc gcaggaggat ctgaagtcag agctcagtgt tgggaaaatg cccgctgtcg agacctcagc acagaggaga acatettgga atgeatacaa ttatgeaggt etgaaettae agatgaaace cccqtctacc ctqqaqaaag ccatctacaq cctccctccq aqccqqaqca aatcqacctc ctegeacace ttteecetgt ageactegea geecetgaac agataqagee ggagteegge cctcgacacg accacaagcg ctcctactcc atggaacact tccggtgggg caaaccggtc ggccgcaaac gcagacccat caaggtgtac acgaacggcg tggaagagga atccgccgaa acgetteegg aagagatgag acgegagetg geaaataaeg aggtegaeta teegeaagaa

Gly Glu Ser His Leu Gln Pro Pro Ser Glu Leu Glu Gln Thr Glu Val

gaga	atgco	ctt t	caaac	ccca	ct go	ggaaa	agaag	g gad	cccc	ccct	acaa	aaat	gac	ccati	tccgc
tgga	tggagcgtcc cgccggctag caagcgctat ggaggcttca tgaagtcctg ggacgagcgt														
gct	gctcagaaac cactgctcac actcttcaaa aacgtaatgc ataaaggcca accgaggaag														
gat	gatgagtga														
<213 <213	<210> 28 <211> 222 <212> PRT <213> Danio rerio														
<400> 28															
Met 1	Val	Arg	Gly	Val 5	Arg	Met	Leu	Cys	Pro 10	Ala	Trp	Leu	Leu	Ala 15	Leu
Ala	Val	Leu	Cys 20	Ala	Gly	Gly	Ser	Glu 25	Val	Arg	Ala	Gln	Cys 30	Trp	Glu
Asn	Ala	Arg 35	Cys	Arg	Asp	Leu	Ser 40	Thr	Glu	Glu	Asn	Ile 45	Leu	Glu	Cys
Ile	Gln 50	Leu	Cys	Arg	Ser	Glu 55		Thr	Asp	Glu	Thr 60	Pro	Val	Tyr	Pro
Gly 65	Glu	Ser	His	Leu	Gln 70	Pro	Pro	Ser	Glu	Pro 75	Glu	Gln	Ile	Asp	Leu 80
Leu	Ala	His	Leu	Ser 85	Pro	Val	Ala	Leu	Ala 90	Ala	Pro	Glu	Gln	Ile 95	Glu
Pro	Glu	Ser	Gly 100	Pro	Arg	His	Asp	His 105	Lys	Arg	Ser	Tyr	Ser 110	Met	Glu
His	Phe	Arg 115	Trp	Gly	Lys	Pro	Val 120	Gly	Arg	Lys	Arg	Arg 125	Pro	Ile	Lys
Val	Tyr 130	Thr	Asn	Gly	Val	Glu 135	Glu	Glu	Ser	Ala	Glu 140	Thr	Leu	Pro	Glu
Glu 145	Met	Arg	Arg	Glu	Leu 150	Ala	Asn	Asn	Glu	Val 155	Asp	Tyr	Pro	Gln	Glu 160
Glu	Met	Pro	Leu	Asn 165	Pro	Leu	Gly	Lys	Lys 170	Asp	Pro	Pro	Tyr	Lys 175	Met

Thr His Phe Arg Trp Ser Val Pro Pro Ala Ser Lys Arg Tyr Gly Gly
180 185 190

Phe Met Lys Ser Trp Asp Glu Arg Ala Gln Lys Pro Leu Leu Thr Leu 195 200 205

Phe Lys Asn Val Met His Lys Gly Gln Pro Arg Lys Asp Glu 210 215 220

<210> 29

<211> 792

<212> DNA

<213> Rana catesbeiana

<400> 29

atgttgcagc cagtctggca cgcctgtatc ctggcaatac ttggggtgtt catatttcat 60 gtcggagagg tccggagcca gtgctgggaa agcaataagt gtacagattt aagcagcgaa 120 gatggcattc tggaatgtat caaagcatgc aagatggacc tctctgcaga atctcccgtg 180 tttcccggca atggccacat ccagcccctt tctgaaaaca tcaggaaata tgtcatgagc 240 cactttcgct ggaataaatt tggtagaagg aacagcacca gcaatgacaa caacaacaac 300 aatggtggct ataagcggga ggatattgcc aactacccta tattgaacct gttccttggc 360 agegacaacc aaaacacaca ggagggaatt atggaagatg acgccttgga taggcaagac 420 agcaaaaggt cttattccat ggagcacttc cgatggggaa aacccgtcgg caagaagagg 480 aggectatea aagtttteee cacagatget gaagaagagt ceteagaaag ttteeccatt 540 gagetgagaa gagagetete tetagagttt gaetateetg acaccaacte egaagaagaa 600 ttggataatg gcgagctgct agaaggtcca gttaaaaaag gtaggaagta caaaatgcac 660 catttccgat gggaaggacc tcccaaagac aagcggtatg gtggatttat gaccccagag 720 agaagccaga cacctttaat gactcttttc aagaatgcta taattaagaa cgcccacaaa 780 aagggccagt ag 792

<210> 30

<211> 263

<212> PRT

<213> Rana catesbeiana

<400> 30

Met Leu Gln Pro Val Trp His Ala Cys Ile Leu Ala Ile Leu Gly Val 1 5 10 15

Phe Ile Phe His Val Gly Glu Val Arg Ser Gln Cys Trp Glu Ser Asn 20 25 30

Lys Cys Thr Asp Leu Ser Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys Ala Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn Gly His Ile Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Ser Asn Asp Asn Asn Asn Asn Gly Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr Pro Ile Leu Asn Leu Phe Leu Gly Ser Asp Asn Gln Asn Thr Gln Glu Gly Ile Met Glu Asp Asp Ala Leu Asp Arg Gln Asp Ser Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Ile Lys Val Phe Pro Thr Asp Ala Glu Glu Ser Ser Glu Ser Phe Pro Ile Glu Leu Arg Arg Glu Leu Ser Leu Glu Phe Asp Tyr Pro Asp Thr Asn Ser Glu Glu Glu Leu Asp Asn Gly Glu Leu Leu Glu Gly Pro Val Lys Lys Gly Arg Lys Tyr Lys Met His His Phe Arg Trp Glu Gly Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His Lys Lys Gly Gln

<210> 31

<211> 272

<212> PRT

<213> Monodelphis domestica

<400> 31

Met Pro Lys Pro Ser Trp Ser Tyr Leu Gly Ala Leu Leu Val Ala Val 1 5 10 15

Leu Phe Gln Ala Ser Val Glu Val His Gly Trp Cys Leu Gln Ala Ser 20 25 30

Asn Cys Arg Asp Ser Lys Ala Glu Asp Gly Leu Val Glu Cys Ile Lys 35 40 45

Ser Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn 50 55 60

Gly Gln Tyr Glu Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser 65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ile Ser Ser Gly Ser 85 90 95

Ile Ser Ser Asp Gly Gly Asn Val Gly Gln Lys Arg Gln Glu Leu Met
100 105 110

Gln Gly Asp Phe Leu Asp Leu Pro Pro Pro Gly Val Trp Gly Glu Asp 115 120 125

Glu Glu Met Gln Glu Gly Leu Pro Leu Ile Arg Lys Ala Arg Glu Leu 130 135 140

Gln Asn Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro 145 150 155 160

Val Gly Lys Lys Arg Arg Pro Val Lys Ile Tyr Pro Asn Gly Val Glu 165 170 175

Glu Glu Ser Ala Glu Ser Tyr Pro Val Glu Ile Arg Arg Asp Leu Pro 180 185 190

Met Lys Ile Asn Phe Pro Glu Tyr Pro Glu Leu Ala Ile Asp Glu Glu
195 200 205

Glu Ala Ala Lys Glu Val Tyr Glu Glu Lys Val Lys Lys Asp Gly Gly 210 215 220

Gly Tyr Lys Met Glu His Phe Arg Trp Gly Thr Pro Pro Lys Asp Lys 225 235 230 Arg Tyr Gly Gly Phe Met Ile Ser Glu Lys Ser His Thr Pro Leu Met 250 245 Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Gly His Lys Lys Gly Gln 260 265 <210> 32 <211> 263 <212> PRT <213> Ovis aries <220> <221> misc feature <222> (184)..(184) <223> Xaa can be any naturally occurring amino acid <400> 32 Met Pro Arg Leu Cys Ser Ser Arg Ser Gly Ala Leu Leu Val Leu Leu Leu Gln Ala Ser Met Glu Val Arg Gly Trp Cys Leu Glu Ser Ser 20 25 Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg 40 Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn 50 55 60 Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly 65 70 75 80 His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Phe 85 90 Gly Ala Gly Gly Ala Ala Gln Lys Arg Glu Glu Glu Val Ala Val Gly 100 105 Glu Gly Pro Gly Pro Arg Gly Asp Gly Ala Glu Thr Gly Pro Arg Glu 115 120

140

Asp Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val

135

Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp 145 150 155 Glu Ser Ala Gln Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr Gly 165 170 Glu Arg Leu Glu Gln Ala Arg Xaa Pro Glu Ala Gln Ala Glu Ser Ala 180 Ala Ala Arg Ala Glu Leu Glu Tyr Gly Leu Val Ala Glu Ala Glu Ala 195 200 Ala Glu Lys Lys Asp Ser Gly Pro Tyr Lys Met Glu His Phe Arg Trp 210 215 220 Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu 225 230 235 240 Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile Lys 245 250 255 Asn Ala His Lys Lys Gly Gln 260 <210> 33 <211> 212 <212> PRT <213> Ovis aries <220> misc feature <221> (120)..(121) Xaa can be any naturally occurring amino acid <400> 33 Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn Cys Asp Glu 5 Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg 20 Trp Asp Arg Phe Gly Arg Asp Gly Ser Ser Ser Phe Gly Ala Gly 35 40 Gly Ala Ala Gln Lys Arg Glu Glu Glu Val Ala Val Gly Glu Gly Pro

60

55

Gly Pro Arg Gly Asp Gly Ala Glu Thr Gly Pro Arg Glu Asp Lys Arg 65 70 75 80

Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys 85 90 95

Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu Ser Ala
100 105 110

Gln Ala Phe Pro Leu Glu Phe Xaa Xaa Glu Leu Thr Gly Glu Arg Leu 115 120 125

Glu Gln Ala Arg Gly Pro Glu Ala Gln Ala Glu Ser Ala Ala Arg 130 135 140

Ala Glu Leu Glu Tyr Gly Leu Val Ala Glu Ala Glu Ala Glu Lys 145 150 155 160

Lys Asp Ser Gly Pro Tyr Lys Met Glu His Phe Arg Trp Gly Ser Pro 165 170 175

Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu Lys Ser Gln 180 185 190

Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His 195 200 205

Lys Lys Gly Gln 210

<210> 34

<211> 263

<212> PRT

<213> Rana catesbeiana

<400> 34

Met Leu Gln Pro Val Trp His Ala Cys Ile Leu Ala Ile Leu Gly Val 5 10 15

Phe Ile Phe His Val Gly Glu Val Arg Ser Gln Cys Trp Glu Ser Asn 20 25 30

Lys Cys Thr Asp Leu Ser Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys 35 40 45

Ala Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn 50 60

Gly His Ile Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser 65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Ser Asn Asp 85 90 95

Asn Asn Asn Asn Gly Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr 100 105 110

Pro Ile Leu Asn Leu Phe Leu Gly Ser Asp Asn Gln Asn Thr Gln Glu 115 120 125

Gly Ile Met Glu Asp Asp Ala Leu Asp Arg Gln Asp Ser Lys Arg Ser 130 135 140

Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg 145 150 155 160

Arg Pro Ile Lys Val Phe Pro Thr Asp Ala Glu Glu Glu Ser Ser Glu
165 170 175

Ser Phe Pro Ile Glu Leu Arg Arg Glu Leu Ser Leu Glu Phe Asp Tyr 180 185 190

Pro Asp Thr Asn Ser Glu Glu Glu Leu Asp Asn Gly Glu Leu Leu Glu
195 200 205

Gly Pro Val Lys Lys Gly Arg Lys Tyr Lys Met His His Phe Arg Trp 210 215 220

Glu Gly Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu 225 230 235 240

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys 245 250 255

Asn Ala His Lys Lys Gly Gln 260

<210> 35

<211> 258

<212> PRT

<213> Spea multiplicata

<400> 35

Met Leu Cys Pro Val Trp Ser Cys Leu Phe Ala Val Leu Gly Val Phe 5 10 15

Val Phe His Val Gly Glu Val Arg Gly Gln Cys Trp Gln Ser Ala Lys 20 25 30

Cys Met Asp Leu Glu Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys Ala 35 40 45

Cys Lys Thr Asp Leu Ser Ala Glu Ser Pro Ile Phe Pro Gly Asn Gly 50 60

His Leu Gln Pro Leu Ala Glu Asn Val Arg Lys Tyr Val Met Ser His 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Thr Thr Gly Asn Glu Gly 85 90 95

Asn Ser Gly Ser Lys Arg Glu Asp Ile Ala Asn Tyr Pro Ile Phe Asn 100 105 110

Leu Phe Pro Ser Ser Asn Gly Gln Asn Thr Glu Asp Asn Met Trp Lys
. 115 120 125

Lys Tyr Gln Asp Arg Gln Asp Asn Lys Arg Ser Tyr Ser Met Glu His 130 135 140

Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys Val 145 150 155 160

Phe Pro Asn Gly Met Glu Glu Glu Ser Ser Glu Ser Tyr Pro Met Glu 165 170 175

Leu Arg Arg Glu Leu Ser Leu Glu Asp Asp Tyr Pro Glu Ile Asp Ser 180 185 190

Glu Asp Asp Leu Asp Tyr Asn Asp Leu Leu Ser Met Pro Lys Phe Lys 195 200 205

Gly Gly Asp Tyr Arg Ile His His Phe Arg Trp Gly Ser Pro Pro Lys 210 215 220

Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr Pro 225 230 235 240

Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His Lys Lys 245 250 255

Ala Gln

<210> 36

<211> 259

<212> PRT

<213> Xenopus laevis

<400> 36

Met Phe Arg Pro Leu Trp Gly Cys Phe Leu Ala Ile Leu Gly Ile Cys

5 10 15

Ile Phe His Ile Gly Glu Val Gln Ser Gln Cys Trp Glu Ser Ser Arg 20 25 30

Cys Ala Asp Leu Ser Ser Glu Asp Gly Val Leu Glu Cys Ile Lys Ala 35 40 45

Cys Lys Thr Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn Gly 50 55 60

His Leu Gln Pro Leu Ser Glu Ser Ile Arg Lys Tyr Val Met Thr His 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Gly Asn Asp Gly 85 90 95

Ser Asn Thr Gly Tyr Lys Arg Glu Asp Ile Ser Ser Tyr Pro Val Phe 100 105 110

Ser Leu Phe Pro Leu Ser Asp Gln Asn Ala Pro Gly Asp Asn Met Glu 115 120 125

Glu Glu Pro Leu Asp Arg Gln Glu Asn Lys Arg Ala Tyr Ser Met Glu 130 135 140

His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys 145 150 155 160

Val Tyr Pro Asn Gly Val Glu Glu Glu Ser Ala Glu Ser Tyr Pro Met 165 170 175

Glu Leu Arg Arg Glu Leu Ser Leu Glu Leu Asp Tyr Pro Glu Ile Asp

180 185 190

Leu Asp Glu Asp Ile Glu Asp Asn Glu Val Lys Ser Ala Leu Thr Lys
195 200 205

Lys Asn Gly Asn Tyr Arg Met His His Phe Arg Trp Gly Ser Pro Pro 210 215 220

Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr 225 230 235 240

Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ser His Lys 245 250 255

Lys Gly Gln

<210> 37

<211> 262

<212> PRT

<213> Necturus maculosus

<220>

<221> misc feature

<222> (129)..(129)

<223> Xaa can be any naturally occurring amino acid

<400> 37

Met Leu Lys Pro Val Trp Ser Cys Leu Phe Ala Thr Leu Gly Ala Leu 1 5 10 15

Leu Cys Gln Thr Val Val Ala His Ser Gln Cys Trp Glu Ser Ser Lys 20 25 30

Cys Arg Asp Leu Ala Thr Glu Gly Ser Val Leu Glu Cys Ile Lys Ala 35 40 45

Cys Lys Val Glu Leu Ser Ala Glu Ser Pro Val Tyr Pro Gly Asn Gly 50 55 60

His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His 70 75 80

Phe Arg Trp Asn Gln Phe Gly Arg Lys Asn Ser Thr Val Ala Ser Gly 85 90 95

Asn Gly Ala Gly Ser Lys Arg Glu Glu Leu Ser Gly Asn Pro Ile Ile

100 105 110

Ser Leu Phe Thr Thr Ser Glu Ser Gln Ser Ser Gly Ala His Asp Ser 115 120 125

Xaa Lys Glu Gly Glu Val Met Asp Arg Gln Asp Asn Lys Arg Ser Tyr 130 135 140

Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg 145 150 155 160

Pro Ile Lys Val Tyr Pro Asn Gly Val Glu Glu Glu Ser Ser Glu Ser 165 170 175

Tyr Pro Leu Glu Leu Lys Arg Asp Leu Ser Leu Gly Leu Glu Tyr Pro 180 185 190

Glu Phe Asp Ser Gln Glu Gly Leu Glu Asn Asn Glu Val Met Val Val
195 200 205

Leu Pro Glu Lys Lys Asp Gly Asn Tyr Arg Met His His Phe Arg Trp 210 215 220

Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu 225 230 235 240

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Lys Asn 245 250 255

Ala His Lys Lys Gly Gln 260

<210> 38

<211> 262

<212> PRT

<213> Amphiuma means

<400> 38

Met Leu Arg Pro Val Trp Ser Cys Leu Pro Ala Thr Leu Gly Ala Leu

5 10 15

Leu Cys Gln Thr Ala Gly Ala Asn Ser Gln Cys Trp Glu Ser Ser Lys

Cys Arg Asp Leu Ala Thr Glu Gly Ser Val Leu Glu Cys Ile Lys Ala 35 40 45 Cys Lys Val Glu Leu Ser Ala Glu Ser Pro Val Tyr Pro Gly Asn Gly His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His Phe Arg Trp Asn Lys Phe Gly Arg Lys Asn Ser Thr Ser Val Ser Gly Asn Ser Ala Gly Asn Lys Arg Glu Glu Leu Ser Asn Asn Pro Ile Ile Ser Leu Phe Thr Thr Ser Glu Ser Gln Ser Ser Gly Ala Asp Asp Gly Asn Lys Glu Glu Ala Met Glu Arg Gln Asp Ser Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys Val Tyr Pro Asn Gly Val Glu Glu Ser Ser Glu Ser Tyr Pro Leu Glu Leu Arg Arg Asp Leu Ser Leu Gly Leu Asp Tyr Pro Asp Ser Asp Ser Gln Glu Gly Leu Glu Asn Asn Glu Ile Thr Thr Gly Leu Thr Lys Lys Asn Asp Lys Gln Tyr Arg Ile Gly His Phe Arg Trp Gly Ser Pro Leu Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Lys Asn

Ala His Lys Lys Gly Gln

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Ala Cys Lys Met Asp Leu Ser Asp Glu Ser Pro Met Tyr Pro Gly Asn 50 55 60

Gly His Leu Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser 65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Lys Asn Ser Ser Ser Ser Val 85 90 95

Ala Gly His Lys Arg Glu Glu Ile Pro Ser His Leu Leu Gly Leu
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Phe Pro Asp Val Ala Pro Ala Gln Arg Gly Asp Asp Gly Glu Gly Gly 115 120 125

Ala Ala Leu Glu Arg Gln Asp Ser Lys Arg Ser Tyr Ser Met Glu His 130 135 140

Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys Val 145 150 155 160

Tyr Pro Ser Glu Val Glu Glu Glu Ser Ala Glu Ser Tyr Pro Pro Glu 165 170 175

Phe Arg Arg Asp Leu Ser Met Glu Leu Asp Tyr Pro Glu Phe Glu Ser 180 185 190

Leu Glu Asp Pro Glu Ser Glu Glu Ala Leu Val Ser Glu Glu Ala Glu
195 200 205

Lys Lys Asp Gly Asn Ser Tyr Lys Met His His Phe Arg Trp Asn Ala 210 215 220

Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu Ser Ser 225 230 235 240

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Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg Trp Asp Arg 20 25 30

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Gln Lys Arg Glu Asp Val Ser Ala Gly Glu Asp Arg Gly Pro Leu Pro 50 55 60

Glu Gly Gly Pro Glu Pro Arg Ser Asp Gly Ala Lys Pro Gly Pro Arg 65 70 75 80

Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro 85 90 95

Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu 100 105 110

Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr 115 120 125

Gly Gln Arg Pro Arg Glu Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp 130 135 140

Gly Ala Gly Ala Gln Ala Asp Leu Glu His Ser Leu Leu Val Ala Ala 145 150 155 160

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SCARPACE, PHILIP J. LI, GANG

<120> RAAV VECTOR-BASED PRO-OPIOMELANOCORTIN COMPOSITIONS AND METHODS OF USE

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<150> 60/462,496

<151> 2003-04-11

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<213> Homo sapiens

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Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Glu Cys Ile Arg 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Met Phe Pro Gly Asn 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Ser Ser Ser Gly 85 90 95

Ser Ser Gly Ala Gly Gln Lys Arg Glu Asp Val Ser Ala Gly Glu Asp
100 105 110

Cys Gly Pro Leu Pro Glu Gly Gly Pro Glu Pro Arg Ser Asp Gly Ala 115 120 125

Lys Pro Gly Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe 130 135 140

Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr 145 150 155 160

Pro Asn Gly Ala Glu Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe 165 170 175

Lys Arg Glu Leu Thr Gly Gln Arg Leu Arg Glu Gly Asp Gly Pro Asp 180 185 190

Gly Pro Ala Asp Asp Gly Ala Gly Ala Gln Ala Asp Leu Glu His Ser 195 200 205

Leu Leu Val Ala Ala Glu Lys Lys Asp Glu Gly Pro Tyr Arg Met Glu 210 215 220

His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe 225 230 235 240

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Phe Gly Arg Arg Asn Ser Ser Ser Ser Ser Gly Ser Gly Ala Gly Gln 35 40 45

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Gly Lys A	arg Ser Tyi 85	Ser Met G	lu His Phe 90	Arg Trp	Gly Lys Pro 95	Val	
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Ala Gly A 145	ala Gln Ala	a Asp Leu G 150	lu His Ser	Leu Leu 155	Val Ala Ala	Glu 160	·
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Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Glu Cys Ile Arg 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn 50 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Ser Ser Ser Gly Ser 85 90 95

Ala His Gln Lys Arg Glu Asp Val Ala Ala Gly Glu Asp Arg Gly Leu
100 105 110

Leu Pro Glu Gly Gly Pro Glu Pro Arg Gly Asp Gly Ala Gly Pro Gly
115 120 125

Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly 130 135 140

Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly 145 150 155 160	
Ala Glu Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu 165 170 175	
Leu Thr Gly Gln Arg Pro Arg Ala Gly Asp Gly Pro Asp Gly Pro Ala 180 185 190	
Asp Asp Gly Ala Gly Pro Arg Ala Asp Leu Glu His Ser Leu Leu Val 195 200 205	
Ala Ala Glu Lys Lys Asp Glu Gly Pro Tyr Arg Met Glu His Phe Arg 210 215 220	
Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser 225 230 235 240	
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Ala Ala Gly Glu Asp Arg Gly Pro Leu Pro Glu Gly Gly Pro Glu Pro 35 40 45

Arg Ser Asp Gly Ala Glu Pro Gly Pro Arg Glu Gly Lys Arg Ser Tyr 50 55 60

Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg 65 70 75 80

Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu Ser Ala Glu Ala 85 90 95

Phe Pro Leu Glu Phe Lys Arg Glu Pro Thr Gly Gln Arg Leu Arg Glu
100 105 110

Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp Gly Ala Gly Ala Arg Ala 115 120 125

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Pro Tyr Arg Met Glu His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys 145 150 155 160

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Gln Cys Gln Asp Leu Ser Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn 50 55 60

Gly Asp Ala Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Gly 85 90 95

Gly Gly Gly Gly Gly Gly Ala Gly Gln Lys Arg Glu Glu Glu Glu 100 105 110

Val Ala Ala Gly Glu Gly Pro Gly Pro Arg Gly Asp Gly Val Ala Pro 115 120 125

Gly Pro Arg Gln Asp Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp 130 135 140

Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn 145 150 155 160

Gly Ala Glu Asp Glu Leu Ala Glu Ala Phe Pro Leu Glu Phe Arg Arg 165 170 175

Glu Leu Ala Gly Ala Pro Pro Glu Pro Ala Arg Asp Pro Glu Ala Pro 180 185 190

Ala Glu Gly Ala Ala Arg Ala Glu Leu Glu Tyr Gly Leu Val Ala 195 200 205

Glu Ala Glu Ala Glu Lys Lys Asp Glu Gly Pro Tyr Lys Met Glu 210 215 220

His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe 225 230 235 240

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Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Ser 85 90 95

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Gly 145	Lys	Lys	Arg	Arg	Pro 150	Val	Lys	Val	Tyr	Pro 155	Asn	Gly	Ala	Glu	Asp 160	
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Gln Pro Leu Ala Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg 35 40 45

Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ala Gly Gln Lys Arg Glu 50 55 60

Glu Glu Glu Val Ala Ala Gly Gly Gly Arg Ala Pro Leu Pro Ala Gly 65 70 75 80

Gly Pro Gly Pro Arg Gly Asp Gly Glu Leu Gly Leu Gln Glu Gly 85 90 95

Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly
100 105 110

Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu 115 120 125 Ser Ala Glu Ala Phe Pro Val Glu Phe Lys Arg Glu Leu Ala Gly Gln 130 135 140

Arg Leu Glu Pro Ala Leu Gly Pro Glu Gly Pro Ala Ala Gly Val Ala 145 150 155 160

Ala Leu Ala Asp Leu Glu Tyr Gly Leu Val Ala Glu Ala Gly Ala Ala 165 170 175

Glu Lys Lys Asp Asp Gly Pro Tyr Lys Met Glu His Phe Arg Trp Gly
180 185 190

Ser Pro Pro Lys Asp Lys Arg Tyr Val Gly Phe Met Ser Ser Glu Arg 195 200 205

Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile 210 215 220

<210> 15

<211> 771

<212> DNA

<213> Cavia porcellus

<400> 15

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<210> 16
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<211> 256

<212> PRT

<213> Cavia porcellus

<400> 16

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Leu Leu Gln Ile Ser Met Glu Val Arg Gly Trp Cys Leu Glu Ser Ser 20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Arg His Leu Leu Glu Cys Leu Arg 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Gly 50 55 60

Ala Asp Glu Gln Thr Pro Thr Glu Ser Pro Arg Lys Tyr Val Thr Gly 65 70 75 80

His Phe Arg Trp Gly Arg Phe Gly Arg Gly Asn Ser Ser Gly Ala Ser 85 90 95

Gln Lys Arg Glu Glu Glu Ala Ala Ala Asp Pro Gly Phe His Gly
100 105 110

Asp Gly Val Glu Pro Gly Leu Arg Glu Asp Lys Arg Ser Tyr Ser Met 115 120 125

Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val 130 135 140

Lys Val Tyr Ala Asn Gly Ala Glu Glu Glu Ser Ala Glu Ala Phe Pro 145 150 155 160

Leu Glu Phe Lys Arg Glu Leu Thr Gly Glu Arg Pro Ala Ala Ala Pro 165 170 175

Gly Pro Asp Gly Leu Gly Phe Gly Leu Val Ala Glu Ala Glu Ala Glu 180 185 190

Ala Ala Ala Glu Lys Lys Asp Ala Ala Glu Lys Lys Asp Asp Gly

195 200 205

Ser Tyr Arg Met Glu His Phe Arg Trp Gly Thr Pro Arg Lys Gly Lys 210 215 220

Arg Tyr Gly Gly Phe Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val 225 230 235 240

Thr Leu Phe Lys Asn Ala Ile Val Lys Asn Ala His Lys Lys Gly Gln
245 250 255

<210> 17

<211> 714

<212> DNA

<213> Rattus norvegicus

<400> 17

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<210> 18

<211> 235

<212> PRT

<213> Rattus norvegicus

<400> 18

Met Pro Arg Phe Cys Tyr Ser Arg Ser Gly Ala Leu Leu Leu Ala Leu 1 5 10 15 Leu Leu Gln Thr Ser Ile Asp Val Trp Ser Trp Cys Leu Glu Ser Ser Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg Ala Cys Arg Leu Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg Trp Asp Arg Phe Gly Pro Arg Asn Ser Ser Ser Ala Gly Gly Ser Ala Gln Arg Arg Ala Glu Glu Glu Thr Ala Gly Gly Asp Gly Arg Pro Glu Pro Ser Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Val Ala Glu Asn Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Glu Gly Glu Gln Pro Asp Gly Leu Glu Gln Val Leu Glu Pro Asp Thr Glu Lys Ala Asp Gly Pro Tyr Arg Val Glu His Phe Arg Trp Gly Asn Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Val His Lys Lys Gly Gln

<211> 708 <212> DNA

<213> Mus musculus

<400> 19

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<210> 20

<211> 235

<212> PRT

<213> Mus musculus

<400> 20

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Leu Leu Gln Thr Ser Ile Asp Val Trp Ser Trp Cys Leu Glu Ser Ser 20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arq 35

Ala Cys Lys Leu Asp Leu Ser Leu Glu Thr Pro Val Phe Pro Gly Asn

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly 75

His	Phe	Arg	Trp	Asp 85	Arg	Phe	Gly	Pro	Arg 90	Asn	Ser	Ser	Ser	Ala 95	Gly	
Ser	Ala	Ala	Gln 100	Arg	Arg	Ala	Glu	Glu 105	Glu	Ala	Val	Trp	Gly 110	Asp	Gly	
Ser	Pro	Glu 115	Pro	Ser	Pro	Arg	Glu 120	Gly	Lys	Arg	Ser	Tyr 125	Ser	Met	Glu	
His	Phe 130	Arg	Trp	Gly	Lys.	Pro 135	Val	Gly	Lys	Lys	Arg 140	Arg	Pro	Val	Lys	
Val 145	Tyr	Pro	Asn	Val	Ala 150	Glu	Asn	Glu	Ser	Ala 155	Glu	Ala	Phe	Pro	Leu 160	
Glu	Phe	Lys	Arg	Glu 165	Leu	Glu	Gly	Glu	Arg 170	Pro	Leu	Gly	Leu	Glu 175	Gln	
Val	Leu	Glu	Ser 180	Asp	Ala	Glu	Lys	Asp 185	Asp	Gly	Pro	Tyr	Arg 190	Val	Glu	
His	Phe	Arg 195	Trp	Ser	Asn	Pro	Pro 200	Lys	Asp	Lys	Arg	Tyr 205	Gly	Gly	Phe	
Met	Thr 210	Ser	Glu	Lys	Ser	Gln 215	Thr	Pro	Leu	Val	Thr 220	Leu	Phe	Lys	Asn	
Ala 225	Ile	Ile	Lys	Asn	Ala 230	His	Lys	Lys	Gly	Gln 235						
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ggtg	gtttt	gc a	aggcg	gtgtg	ge ea	aggo	atgo	: cgt	gctg	jagc	tgto	ggcc	ga g	gcac	ccgtg	180
taco	ccggg	jca a	tggg	gcaco	et go	agco	ccto	tc <u>c</u>	gaga	igca	tccg	ıcaag	rta c	gtga	tgagc	240
catt	tccg	gct g	ggaac	aagt	t cg	geeg	tcgc	aac	agca	igca	gcgg	aggg	ca c	aaaa	ıgggag	300
gago	gtggd	cg g	geete	gcc	t go	ctgo	cgcg	, tca	cccc	acc	acco	cgcc	gg g	gagg	jaggaa	360

gatggagaag	ggttggaacg	agaggaaggg	aagcgctcct	actccatgga	gcatttccgc	420
tggggcaagc	cggtggggcg	gaagaggaga	cccatcaagg	tgtaccccaa	cggggtggac	480
gaggagtcgg	ctgagagtta	ccccatggag	ttccggaggg	agatggcgcc	cgatggggac	540
cccttcggcc	tctccgagga	ggaggaagaa	gaggaggaag	aggaaggcga	ggaggaaaag	600
aaggatggag	gctcgtaccg	catgcggcac	ttccgctggc	acgcgccgct	gaaggacaag	660
cgctacggcg	gcttcatgag	cttggagcac	agccagaccc	cgctgatgac	tctgttcaaa	720
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<210> 22

<211> 251

<212> PRT

<213> Gallus gallus

<400> 22

Met Arg Gly Ala Leu Cys His Ser Leu Pro Val Val Leu Gly Leu Leu 1 5 10 15

Leu Cys His Pro Thr Thr Ala Ser Gly Pro Cys Trp Glu Asn Ser Lys 20 25 30

Cys Gln Asp Leu Ala Thr Glu Ala Gly Val Leu Ala Cys Ala Lys Ala 35 40 45

Cys Arg Ala Glu Leu Ser Ala Glu Ala Pro Val Tyr Pro Gly Asn Gly 50 55 60

His Leu Gln Pro Leu Ser Glu Ser Ile Arg Lys Tyr Val Met Ser His 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Ser Ser Gly Gly His 85 90 95

Lys Arg Glu Glu Val Ala Gly Leu Ala Leu Pro Ala Ala Ser Pro His 100 105 110

His Pro Ala Gly Glu Glu Glu Asp Gly Glu Gly Leu Glu Arg Glu Glu
115 120 125

Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val 130 135 140 Gly Arg Lys Arg Arg Pro Ile Lys Val Tyr Pro Asn Gly Val Asp Glu 145 150 155 160

Glu Ser Ala Glu Ser Tyr Pro Met Glu Phe Arg Arg Glu Met Ala Pro 165 170 175

Asp Gly Asp Pro Phe Gly Leu Ser Glu Glu Glu Glu Glu Glu Glu Glu 180 185 190

Glu Glu Glu Glu Glu Lys Lys Asp Gly Gly Ser Tyr Arg Met Arg
195 200 205

His Phe Arg Trp His Ala Pro Leu Lys Asp Lys Arg Tyr Gly Gly Phe 210 215 220

Met Ser Leu Glu His Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn 225 230 235 240

Ala Ile Val Lys Ser Ala Tyr Lys Lys Gly Gln 245 250

<210> 23

<211> 780

<212> DNA

<213> Bufo marinus

<400> 23

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ccactaatga ctctttcaa aaatgccatt atcaaaaatg cccacaagaa gggtcaataa

- <210> 24
- <211> 259
- <212> PRT
- <213> Bufo marinus
- <220>
- <221> misc_feature
- <222> (174)..(174)
- <223> Xaa can be any naturally occurring amino acid
- <400> 24

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1 5 10 15

Ile Phe His Val Gly Glu Val Lys Ser Gln Cys Trp Glu Ser Gly Lys 20 25 30

Cys Ala Asp Leu Thr Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys Asp 35 40 45

Cys Lys Met Val Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn Gly 50 55 60

His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Gly Gly Asp Ser 85 90 95

Asn Asn Ala Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr Pro Ile Phe100 105 110

Asn Leu Phe Pro Thr Asn Asp Asn Gln Asn Thr Gln Asp Gly Asn Met
115 120 125

Glu Glu Glu Leu Arg Arg Gln Asp Asn Lys Arg Ser Tyr Ser Met Glu 130 135 140

His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Ile Lys 145 150 155 160

Val Phe Pro Ser Asp Ala Glu Glu Glu Ser Ser Glu Ile Xaa Pro Thr.
165 170 175

Glu Tyr Arg Arg Glu Leu Ser Val Glu Phe Asp Tyr Pro Asp Thr Asn 180 185 190

Ser Glu Glu Asp Met Asp Asp Ser Met Leu Met Glu Ser Pro Asn Arg 195 200 205

Lys Asp Arg Lys Tyr Lys Met His His Phe Arg Trp Glu Gly Pro Pro 210 215 220

Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr 225 230 235 240

Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His Lys
245 250 255

Lys Gly Gln

<210> 25

<211> 669

<212> DNA

<213> Cyprinus carpio

<400> 25

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gaccagtga 669

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<400)> :	26													
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Ala	Val	Leu	Cys 20	Ala	Ala	Gly	Ser	Glu 25	Val	Arg	Ala	Gln	Cys 30	Met	Glu
Asp	Ala	Arg 35	Cys	Arg	Asp	Leu	Thr 40	Thr	Asp	Glu	Asn	Ile 45	Leu	Asp	Cys
Ile	Gln 50	Leu	Cys	Arg	Ser	Asp 55	Leu	Thr	Asp	Glu	Thr 60	Pro	Val	Tyr	Pro
Gly 65	Glu	Ser	His	Leu	Gln 70	Pro	Pro	Ser	Glu	Leu 75	Glu	Gln	Thr	Glu	Val 80
Leu	Val	Pro	Leu	Ser 85	Pro	Ala	Ala	Leu	Ala 90	Pro	Ala	Glu	Gln	Met 95	Asp
Pro	Glu	Ser	Ser 100	Pro	Gln	His	Glu	His 105	Lys	Arg	Ser	Tyr	Ser 110	Met	Glu
His	Phe	Arg 115	Trp	Gly	Lys	Pro	Val 120	Gly	Arg	Lys	Arg	Arg 125	Pro	Ile	Lys
Val	Tyr 130	Thr	Asn	Gly	Val	Glu 135	Glu	Glu	Ser	Thr	Glu 140	Thr	Leu	Pro	Ala
Glu 145	Met	Arg	Arg	Glu	Leu 150	Ala	Thr	Asn	Glu	Ile 155	Asp	Tyr	Pro	Gln	Glu 160
Glu	Gly	Ala	Leu	Asn 165	Gln	Gln	Asp	Lys	Lys 170	Asp	Gly	Ser	Tyr	Lys 175	Met

Ser His Phe Arg Trp Ser Ser Pro Pro Ala Ser Lys Arg Tyr Gly Gly 180 185 190

Phe Met Lys Ser Trp Asp Glu Arg Ser Gln Lys Pro Leu Leu Thr Leu 195 200 205

Phe Lys Asn Val Ile Asn Lys Glu His Gln Lys Lys Asp Gln 210 215 220

<210> 27

<211> 669

<212> DNA

<213> Danio rerio

<400> 27

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<210> 28

<211> 222

<212> PRT

<213> Danio rerio

<400> 28

Met Val Arg Gly Val Arg Met Leu Cys Pro Ala Trp Leu Leu Ala Leu 1 5 10 15

Ala Val Leu Cys Ala Gly Gly Ser Glu Val Arg Ala Gln Cys Trp Glu 20 25 30

Asn Ala Arg Cys Arg Asp Leu Ser Thr Glu Glu Asn Ile Leu Glu Cys

Ile	Gln 50	Leu	Cys	Arg	Ser	Glu 55	Leu	Thr	Asp	Glu	Thr 60	Pro	Val	Tyr	Pro
Gly 65	Glu	Ser	His	Leu	Gln 70	Pro	Pro	Ser	Glu	Pro 75	Glu	Gln	Ile	Asp	Leu 80

Leu Ala His Leu Ser Pro Val Ala Leu Ala Ala Pro Glu Gln Ile Glu

Pro Glu Ser Gly Pro Arg His Asp His Lys Arg Ser Tyr Ser Met Glu

His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Pro Ile Lys

Val Tyr Thr Asn Gly Val Glu Glu Ser Ala Glu Thr Leu Pro Glu

Glu Met Arg Arg Glu Leu Ala Asn Asn Glu Val Asp Tyr Pro Gln Glu

Glu Met Pro Leu Asn Pro Leu Gly Lys Lys Asp Pro Pro Tyr Lys Met

Thr His Phe Arg Trp Ser Val Pro Pro Ala Ser Lys Arg Tyr Gly Gly

Phe Met Lys Ser Trp Asp Glu Arg Ala Gln Lys Pro Leu Leu Thr Leu

Phe Lys Asn Val Met His Lys Gly Gln Pro Arg Lys Asp Glu

<210> 29

<211> 792

<212> DNA

<213> Rana catesbeiana

<400> 29

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gatggcattc tggaatgtat caaagcatgc aagatggacc tctctgcaga atctcccgtg 180 tttcccggca atggccacat ccagcccctt tctgaaaaca tcaggaaata tgtcatgagc 240 cactttcgct ggaataaatt tggtagaagg aacagcacca gcaatgacaa caacaacaac 300 aatggtggct ataagcggga ggatattgcc aactacccta tattgaacct gttccttggc 360 agcgacaacc aaaacacaca ggagggaatt atggaagatg acgccttgga taggcaagac 420 agcaaaaggt cttattccat ggagcacttc cgatggggaa aacccgtcgg caagaagagg 480 aggectatea aagtttteec cacagatget gaagaagagt ceteagaaag ttteeceatt 540 gagctgagaa gagagctctc tctagagttt gactatcctg acaccaactc cgaagaagaa 600 ttggataatg gcgagctgct agaaggtcca gttaaaaaaag gtaggaagta caaaatgcac 660 catttccgat gggaaggacc tcccaaagac aagcggtatg gtggatttat gaccccagag 720 agaagccaga cacctttaat gactcttttc aagaatgcta taattaagaa cgcccacaaa 780 aagggccagt ag 792

<210> 30

<211> 263

<212> PRT

<213> Rana catesbeiana

<400> 30

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Phe Ile Phe His Val Gly Glu Val Arg Ser Gln Cys Trp Glu Ser Asn 20 25 30

Lys Cys Thr Asp Leu Ser Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys 35 40 45

Ala Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn 50 55 60

Gly His Ile Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser 65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Ser Asn Asp 85 90 95

Asn Asn Asn Asn Gly Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr

Pro Ile Leu Asn Leu Phe Leu Gly Ser Asp Asn Gln Asn Thr Gln Glu 115 120 125

Gly Ile Met Glu Asp Asp Ala Leu Asp Arg Gln Asp Ser Lys Arg Ser 130 135 140

Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg 145 150 155 160

Arg Pro Ile Lys Val Phe Pro Thr Asp Ala Glu Glu Glu Ser Ser Glu
165 170 175

Ser Phe Pro Ile Glu Leu Arg Arg Glu Leu Ser Leu Glu Phe Asp Tyr 180 185 190

Pro Asp Thr Asn Ser Glu Glu Glu Leu Asp Asn Gly Glu Leu Leu Glu
195 200 205

Gly Pro Val Lys Lys Gly Arg Lys Tyr Lys Met His His Phe Arg Trp 210 215 220

Glu Gly Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu 225 230 235 240

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys 245 250 255

Asn Ala His Lys Lys Gly Gln 260

<210> 31

<211> 272

<212> PRT

<213> Monodelphis domestica

<400> 31

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Leu Phe Gln Ala Ser Val Glu Val His Gly Trp Cys Leu Gln Ala Ser 20 25 30

- Asn Cys Arg Asp Ser Lys Ala Glu Asp Gly Leu Val Glu Cys Ile Lys 35 40 45
- Ser Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn 50 55 60
- Gly Gln Tyr Glu Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser 65 70 75 80
- His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ile Ser Ser Gly Ser 85 90 95
- Ile Ser Ser Asp Gly Gly Asn Val Gly Gln Lys Arg Gln Glu Leu Met 100 105 110
- Gln Gly Asp Phe Leu Asp Leu Pro Pro Pro Gly Val Trp Gly Glu Asp 115 120 125
- Glu Glu Met Gln Glu Gly Leu Pro Leu Ile Arg Lys Ala Arg Glu Leu 130 135 140
- Gln Asn Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro 145 150 155 160
- Val Gly Lys Lys Arg Arg Pro Val Lys Ile Tyr Pro Asn Gly Val Glu 165 · 170 175
- Glu Glu Ser Ala Glu Ser Tyr Pro Val Glu Ile Arg Arg Asp Leu Pro 180 185 190
- Met Lys Ile Asn Phe Pro Glu Tyr Pro Glu Leu Ala Ile Asp Glu Glu
 195 200 205
- Glu Ala Ala Lys Glu Val Tyr Glu Glu Lys Val Lys Lys Asp Gly Gly 210 215 220
- Gly Tyr Lys Met Glu His Phe Arg Trp Gly Thr Pro Pro Lys Asp Lys 225 230 235 240
- Arg Tyr Gly Gly Phe Met Ile Ser Glu Lys Ser His Thr Pro Leu Met 245 250 255

Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Gly His Lys Lys Gly Gln 260 265 270

<210> 32

<211> 263

<212> PRT

<213> Ovis aries

<220>

<221> misc feature

<222> (184)..(184)

<223> Xaa can be any naturally occurring amino acid

<400> 32

Met Pro Arg Leu Cys Ser Ser Arg Ser Gly Ala Leu Leu Leu Val Leu 1 5 10 15

Leu Leu Gln Ala Ser Met Glu Val Arg Gly Trp Cys Leu Glu Ser Ser 20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Phe 85 90 95

Gly Ala Gly Gly Ala Ala Gln Lys Arg Glu Glu Val Ala Val Gly
100 105 110

Glu Gly Pro Gly Pro Arg Gly Asp Gly Ala Glu Thr Gly Pro Arg Glu 115 120 125

Asp Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val

Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp 145 150 155 160 Glu Ser Ala Gln Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr Gly 165 170 Glu Arg Leu Glu Gln Ala Arg Xaa Pro Glu Ala Gln Ala Glu Ser Ala 185 180 Ala Ala Arg Ala Glu Leu Glu Tyr Gly Leu Val Ala Glu Ala Glu Ala Ala Glu Lys Lys Asp Ser Gly Pro Tyr Lys Met Glu His Phe Arg Trp 215 Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu 230 225 235 Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile Lys 245 250 Asn Ala His Lys Lys Gly Gln 260 <210> 33 <211> 212 <212> PRT <213> Ovis aries <220> <221> misc feature (120)..(121) <222> <223> Xaa can be any naturally occurring amino acid <400> 33 Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn Cys Asp Glu 5 10 15 Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg 20 25 Trp Asp Arg Phe Gly Arg Asp Gly Ser Ser Ser Phe Gly Ala Gly

Gly Ala Ala Gln Lys Arg Glu Glu Val Ala Val Gly Glu Gly Pro

Gly Pro Arg Gly Asp Gly Ala Glu Thr Gly Pro Arg Glu Asp Lys Arg 65

Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys 95

Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu Ser Ala 100 105 110

Gln Ala Phe Pro Leu Glu Phe Xaa Xaa Glu Leu Thr Gly Glu Arg Leu 115 120 125

Glu Gln Ala Arg Gly Pro Glu Ala Gln Ala Glu Ser Ala Ala Arg 130 135 140

Ala Glu Leu Glu Tyr Gly Leu Val Ala Glu Ala Glu Ala Glu Lys
145 150 155 160

Lys Asp Ser Gly Pro Tyr Lys Met Glu His Phe Arg Trp Gly Ser Pro 165 170 175

Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu Lys Ser Gln
180 185 190

Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His
195 200 205

Lys Lys Gly Gln 210

<210> 34

<211> 263

<212> PRT

<213> Rana catesbeiana

<400> 34

Met Leu Gln Pro Val Trp His Ala Cys Ile Leu Ala Ile Leu Gly Val 1 5 10 15

Phe Ile Phe His Val Gly Glu Val Arg Ser Gln Cys Trp Glu Ser Asn 20 25 30

Lys Cys Thr Asp Leu Ser Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys
35 40 45

Ala Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn 50 55 60

Gly His Ile Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser 65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Ser Asn Asp 85 90 95

Asn Asn Asn Asn Gly Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr 100 105 110

Pro Ile Leu Asn Leu Phe Leu Gly Ser Asp Asn Gln Asn Thr Gln Glu 115 120 125

Gly Ile Met Glu Asp Asp Ala Leu Asp Arg Gln Asp Ser Lys Arg Ser 130 135 140

Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg 145 150 155 160

Arg Pro Ile Lys Val Phe Pro Thr Asp Ala Glu Glu Glu Ser Ser Glu
165 170 175

Ser Phe Pro Ile Glu Leu Arg Arg Glu Leu Ser Leu Glu Phe Asp Tyr 180 185 190

Pro Asp Thr Asn Ser Glu Glu Glu Leu Asp Asn Gly Glu Leu Leu Glu
195 ' 200 205

Gly Pro Val Lys Lys Gly Arg Lys Tyr Lys Met His His Phe Arg Trp 210 215 220

Glu Gly Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu 225 230 235

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys
245 250 255

Asn Ala His Lys Lys Gly Gln 260 <210> 35

<211> 258

<212> PRT

<213> Spea multiplicata

<400> 35

Met Leu Cys Pro Val Trp Ser Cys Leu Phe Ala Val Leu Gly Val Phe 1 5 10 15

Val Phe His Val Gly Glu Val Arg Gly Gln Cys Trp Gln Ser Ala Lys
20 25 30

Cys Met Asp Leu Glu Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys Ala 35 40 45

Cys Lys Thr Asp Leu Ser Ala Glu Ser Pro Ile Phe Pro Gly Asn Gly 50 55 60

His Leu Gln Pro Leu Ala Glu Asn Val Arg Lys Tyr Val Met Ser His 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Thr Thr Gly Asn Glu Gly 85 90 95

Asn Ser Gly Ser Lys Arg Glu Asp Ile Ala Asn Tyr Pro Ile Phe Asn 100 105 110

Leu Phe Pro Ser Ser Asn Gly Gln Asn Thr Glu Asp Asn Met Trp Lys
115 120 125

Lys Tyr Gln Asp Arg Gln Asp Asn Lys Arg Ser Tyr Ser Met Glu His 130 \$135\$

Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys Val 145 150 155 160

Phe Pro Asn Gly Met Glu Glu Glu Ser Ser Glu Ser Tyr Pro Met Glu 165 170 175

Leu Arg Arg Glu Leu Ser Leu Glu Asp Asp Tyr Pro Glu Ile Asp Ser 180 185 190

Glu Asp Asp Leu Asp Tyr Asn Asp Leu Leu Ser Met Pro Lys Phe Lys

195 200 205

Gly Gly Asp Tyr Arg Ile His His Phe Arg Trp Gly Ser Pro Pro Lys 210 220

Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr Pro 225 230 235 240

Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His Lys Lys 245 250 255

Ala Gln

<210> 36

<211> 259

<212> PRT

<213> Xenopus laevis

<400> 36

Met Phe Arg Pro Leu Trp Gly Cys Phe Leu Ala Ile Leu Gly Ile Cys 1 5 10 15

Ile Phe His Ile Gly Glu Val Gln Ser Gln Cys Trp Glu Ser Ser Arg
20 25 30

Cys Ala Asp Leu Ser Ser Glu Asp Gly Val Leu Glu Cys Ile Lys Ala 35 40 45

Cys Lys Thr Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn Gly 50 55 60

His Leu Gln Pro Leu Ser Glu Ser Ile Arg Lys Tyr Val Met Thr His 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Gly Asn Asp Gly 85 90 95

Ser Asn Thr Gly Tyr Lys Arg Glu Asp Ile Ser Ser Tyr Pro Val Phe 100 105 110

Ser Leu Phe Pro Leu Ser Asp Gln Asn Ala Pro Gly Asp Asn Met Glu 115 120 125

Glu Glu Pro Leu Asp Arg Gln Glu Asn Lys Arg Ala Tyr Ser Met Glu 130 135 His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys 145 150 155 Val Tyr Pro Asn Gly Val Glu Glu Ser Ala Glu Ser Tyr Pro Met 165 170 175 Glu Leu Arg Arg Glu Leu Ser Leu Glu Leu Asp Tyr Pro Glu Ile Asp 180 185 190 Leu Asp Glu Asp Ile Glu Asp Asn Glu Val Lys Ser Ala Leu Thr Lys 195 200 205 Lys Asn Gly Asn Tyr Arg Met His His Phe Arg Trp Gly Ser Pro Pro 215 Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr 225 230 Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ser His Lys 250 Lys Gly Gln <210> 37 <211> 262 <212> PRT <213> Necturus maculosus <220> <221> misc feature <222> (129)..(129) <223> Xaa can be any naturally occurring amino acid <400> 37 Met Leu Lys Pro Val Trp Ser Cys Leu Phe Ala Thr Leu Gly Ala Leu

Leu Cys Gln Thr Val Val Ala His Ser Gln Cys Trp Glu Ser Ser Lys

25

20

- Cys Arg Asp Leu Ala Thr Glu Gly Ser Val Leu Glu Cys Ile Lys Ala 35 40 45
- Cys Lys Val Glu Leu Ser Ala Glu Ser Pro Val Tyr Pro Gly Asn Gly 50 55 60
- His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His 65 70 75 80
- Phe Arg Trp Asn Gln Phe Gly Arg Lys Asn Ser Thr Val Ala Ser Gly 85 90 95
- Asn Gly Ala Gly Ser Lys Arg Glu Glu Leu Ser Gly Asn Pro Ile Ile 100 105 110
- Ser Leu Phe Thr Thr Ser Glu Ser Gln Ser Ser Gly Ala His Asp Ser 115 120 125
- Xaa Lys Glu Gly Glu Val Met Asp Arg Gln Asp Asn Lys Arg Ser Tyr 130 135 140
- Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg 145 150 155 160
- Pro Ile Lys Val Tyr Pro Asn Gly Val Glu Glu Glu Ser Ser Glu Ser 165 170 175
- Tyr Pro Leu Glu Leu Lys Arg Asp Leu Ser Leu Gly Leu Glu Tyr Pro 180 185 190
- Glu Phe Asp Ser Gln Glu Gly Leu Glu Asn Asn Glu Val Met Val Val
 195 200 205
- Leu Pro Glu Lys Lys Asp Gly Asn Tyr Arg Met His His Phe Arg Trp 210 215 220
- Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu 225 230 235 240
- Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Lys Asn 245 250 255

Ala His Lys Lys Gly Gln 260

<210> 38

<211> 262

<212> PRT

<213> Amphiuma means

<400> 38

Met Leu Arg Pro Val Trp Ser Cys Leu Pro Ala Thr Leu Gly Ala Leu

1 5 10 15

Leu Cys Gln Thr Ala Gly Ala Asn Ser Gln Cys Trp Glu Ser Ser Lys
20 25 30

Cys Arg Asp Leu Ala Thr Glu Gly Ser Val Leu Glu Cys Ile Lys Ala 35 40 45

Cys Lys Val Glu Leu Ser Ala Glu Ser Pro Val Tyr Pro Gly Asn Gly 50 55 60

His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Lys Asn Ser Thr Ser Val Ser Gly 85 90 95

Asn Ser Ala Gly Asn Lys Arg Glu Glu Leu Ser Asn Asn Pro Ile Ile 100 105 110

Ser Leu Phe Thr Thr Ser Glu Ser Gln Ser Ser Gly Ala Asp Asp Gly 115 120 125

Asn Lys Glu Gly Glu Ala Met Glu Arg Gln Asp Ser Lys Arg Ser Tyr 130 135 140

Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg 145 150 155 160

Pro Ile Lys Val Tyr Pro Asn Gly Val Glu Glu Glu Ser Ser Glu Ser 165 170 175

Tyr Pro Leu Glu Leu Arg Arg Asp Leu Ser Leu Gly Leu Asp Tyr Pro 180 185 190 Asp Ser Asp Ser Gln Glu Gly Leu Glu Asn Asn Glu Ile Thr Thr Gly 195 200 205

Leu Thr Lys Lys Asn Asp Lys Gln Tyr Arg Ile Gly His Phe Arg Trp 210 215 220

Gly Ser Pro Leu Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu 225 230 235 240

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Lys Asn 245 250 255

Ala His Lys Lys Gly Gln 260

<210> 39

<211> 261

<212> PRT

<213> Pelodiscus sinensis

<400> 39

Met Leu Lys Pro Val Arg Ser Gly Leu Leu Ala Ile Leu Gly Val Leu 1 5 10 15

Leu Phe His Ala Asp Gly Gly Val His Ser Gln Cys Trp Asp Ser Ser 20 25 30

Arg Cys Arg Glu Leu Ser Thr Asp Ala Gly Leu Leu Glu Cys Ile Lys 35 40 45

Ala Cys Lys Met Asp Leu Ser Asp Glu Ser Pro Met Tyr Pro Gly Asn 50 55 60

Gly His Leu Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser 65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Lys Asn Ser Ser Ser Ser Val 85 90 95

Ala Gly His Lys Arg Glu Glu Ile Pro Ser His Leu Leu Gly Leu
100 105 110

Phe Pro Asp Val Ala Pro Ala Gln Arg Gly Asp Asp Gly Glu Gly Gly 115 120 Ala Ala Leu Glu Arg Gln Asp Ser Lys Arg Ser Tyr Ser Met Glu His 130 135 140 Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys Val 150 Tyr Pro Ser Glu Val Glu Glu Glu Ser Ala Glu Ser Tyr Pro Pro Glu 170 Phe Arg Arg Asp Leu Ser Met Glu Leu Asp Tyr Pro Glu Phe Glu Ser 180 185 Leu Glu Asp Pro Glu Ser Glu Glu Ala Leu Val Ser Glu Glu Ala Glu 195 200 205 Lys Lys Asp Gly Asn Ser Tyr Lys Met His His Phe Arg Trp Asn Ala 210 215 220 Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu Ser Ser 225 230 Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala Tyr Lys Lys Gly Gln 260

<210> 40

<211> 187

<212> PRT

<213> Pan troglodytes

<400> 40

Ser Ala Glu Thr Pro Met Phe Pro Gly Asn Gly Asp Glu Gln Pro Leu 1 5 10 15

Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg Trp Asp Arg 20 25 30

Phe Gly Arg Arg Asn Ser Ser Ser Ser Ser Gly Ser Gly Ala Gly 35 40 45

50 55 60 Glu Gly Gly Pro Glu Pro Arg Ser Asp Gly Ala Lys Pro Gly Pro Arg 70 Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu 105 Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr 115 120 125 Gly Gln Arg Pro Arg Glu Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp 130 135 140 Gly Ala Gly Ala Gln Ala Asp Leu Glu His Ser Leu Leu Val Ala Ala 145 150 155 160 Glu Lys Lys Asp Glu Gly Pro Tyr Arg Met Glu His Phe Arg Trp Gly 165 170 175 Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe 180 <210> 41 <211> 20 <212> DNA <213> Artificial <220> <223> SYNTHETIC OLIGONUCLEOTIDE <400> 41 gcttgcaaac tcgacctctc

<210> 42 <211> 20 <212> DNA

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20

Gln Lys Arg Glu Asp Val Ser Ala Gly Glu Asp Arg Gly Pro Leu Pro

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